



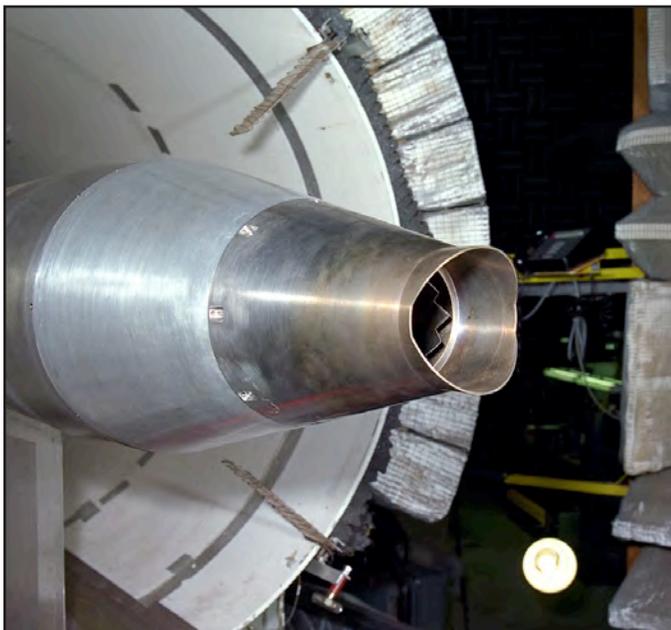
Aero-Acoustic Propulsion Laboratory at NASA Glenn Research Center

The Aero-Acoustic Propulsion Laboratory (AAPL) is a world-class facility providing outstanding testing services in aircraft noise reduction, with an emphasis in engine nozzle and fan components. A large far-field arena is used at the Nozzle Acoustic Test Rig (NATR) to acquire flyby and sideline acoustic data of nozzle concepts at simulated flight conditions up to Mach 0.35.

Facility Benefits

AAPL provides three state-of-the-art acoustic test rigs:

- Nozzle Acoustic Test Rig (NATR)—supporting aircraft nozzle acoustic research
 - Free-jet acoustic tunnel simulating flight conditions up to Mach 0.35
 - High Flow Jet Exit Rig (HFJER) used to simulate nozzle pressure and temperature conditions
 - Large far-field acoustic measurement arena used to acquire sideline and flyby acoustic data measurements
- Small Hot Jet Acoustic Rig (SHJAR)—supporting jet noise fundamental research
- Advanced Noise Control Fan (ANCF)—supporting fan acoustic research



Nozzle Acoustic Test Rig (NATR).



Advanced Noise Control Fan (ANCF) in compact acoustic arena.

Commercial Applications

The dome provides an anechoic testing environment for acoustic measurements of aeropropulsion components.

Programs and Projects Supported

- Fundamental Aeronautics Subsonic and Supersonic Research
- Quiet Aircraft Technology (QAT)
- Ultra-Efficient Engine Technology (UEET)
- Low Emissions Alternative Power (LEAP)

Capabilities

- Advanced diagnostic testing capabilities
- State-of-the-art control room
- In-house and private industry research programs
- Highly qualified staff of technicians, engineers, researchers, and operators

AAPL	
Test section speed, Mach	0.10 to 0.35
Simulated alt., ft	Sea level
Dynamic pressure, lb/ft ²	NPR = 4.5 T = 1425 °F
Test section total temperature, °R	Ambient
Auxilliary air supply	
At 150 psig	130 lbm/s
At 450 psig	30 lbm/s
Model exhaust	Heated
Fuels	Gaseous Methane Gaseous H ₂

Facility Testing Information

<http://facilities.grc.nasa.gov>

Contact

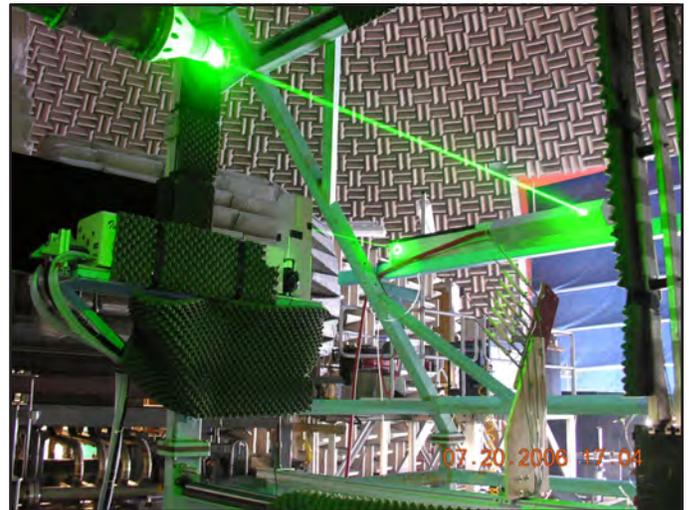
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A test rig is assembled to evaluate the noise reduction of a newly developed metallic foam liner.



Twin jet hardware in Nozzle Acoustic Test Rig (NATR).



Small Hot Jet Acoustic Rig (SHJAR) Particle Image Velocimetry Test.